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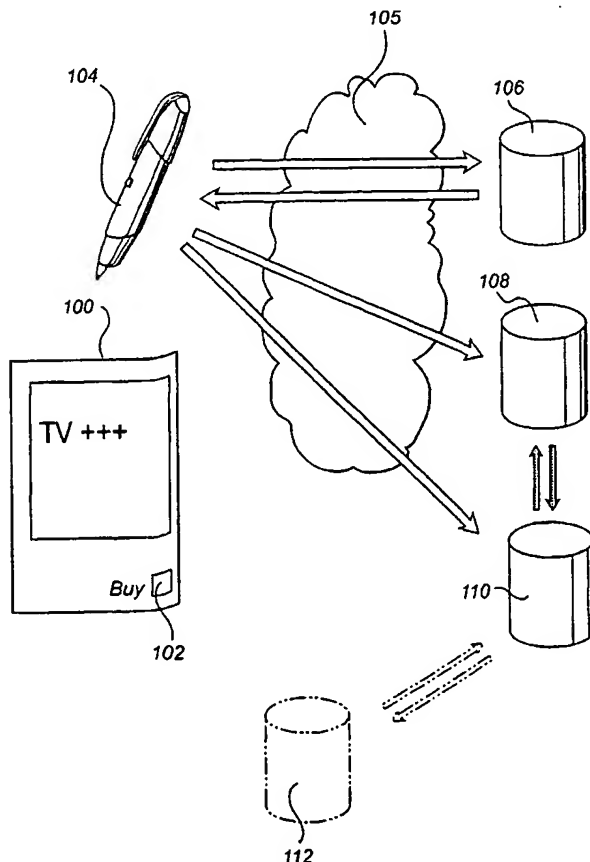
(57) **Abstract:** In a method for a person to carry out an operation in a network-based system, for example a payment, concerning goods or services indicated on a product, the person gives an instruction to the system to the effect that the operation is to be carried out using person-specific information previously stored in the system, by reading off a position-coding pattern in an operation field on the product using a hand-held device. The operation field is provided with a position-coding pattern that codes coordinates that represent said instruction in the system. The position-coding pattern makes it possible for the person to record electronically graphical information, for example a message or a specification of the operation, which is sent to a party in the system.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

NETWORK-BASED SYSTEM

Field of the Invention

This invention relates to different aspects of a
network-based system for carrying out operations concern-
ing goods or services that are indicated on a product
and more specifically to a method, a computer program,
5   a device, a system and a product that can be used in
this connection.

Background Art

There is a trend towards increased mobility in
today's society. People want, for example, to be able
to communicate, retrieve information, order goods and
10   services, and carry out various tasks regardless of where
they are and independent of access to stationary devices.
In order to meet this requirement, a number of portable
and hand-held devices have been developed, such as port-
able computers, mobile telephones, PDAs and reading pens.
15   A further category of hand-held devices is electro-
nic pens, using which it is possible to write and draw
in the same way as with an ordinary pen, but which at the
same time electronically record what is written by means
of a sensor, for example a CCD or an accelerometer.
20   The Applicant has developed an electronic pen that
is intended to be used on a surface which is provided
with a position-coding pattern and which has an optical
sensor which continually reads off the position-coding
pattern in order to record what is written electronically
25   in the form of coordinates. The position-coding pattern
and the pen is described in e.g. WO 01/26032, which is
hereby incorporated by reference. A pen of a similar
type is described in US 5,852,434.

The Applicant's pen can, among other things, be
30   used to write messages and to send these via a mobile
phone to another mobile phone or via the mobile phone
and the Internet to a computer.

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There is, however, a wish to be able to use an electronic pen for purposes other than recording text and sending messages.

Summary of the Invention

This wish is fulfilled completely or partially by
5 a method according to claim 1, a method according to claim 6, a memory medium according to claim 20, a hand-held device according to claim 21, a system according to claim 22 and a product according to claim 24.

According to a first aspect, the present invention
10 thus relates to a method enabling a person to initiate an operation in a network-based system regarding goods or services that are indicated on a product. The method is characterized by the step of giving an instruction to the system that the operation is to be carried out using
15 person-specific information previously stored in the system, by reading off a position-coding pattern in an operation field on the product using a hand-held device, which operation field is provided with a position-coding pattern which codes coordinates representing said in-
20 struction in the system.

According to this method, a person can thus initiate an operation, for example make a payment, simply by reading off a position-coding pattern. No information needs to be written down or entered in any other way,
25 no information needs to be memorized and no information needs to be sent on paper which can be copied and end up in the wrong hands. By reading off the position-coding pattern the person gives an instruction to the system that a particular operation is to be carried out and that
30 person-specific information previously stored in the system is to be used to carry out the operation. This is the simplest possible way of carrying out an operation in a network-based system.

The operation can be carried out in a completely
35 mobile way. All that is required is a hand-held device for reading off the position-coding pattern. The communi-

cation with other units in the network-based system can
take place immediately or at a later time.

The operation concerns goods or services in a wide
sense. The goods or services can already have been de-
5   livered or can be about to be delivered in the future as
a result of the operation. The operation can preferably
consist of a payment for the goods or services, in which
case the person-specific information can be an account
from which the payment is to be made. It can, however,
10   also consist of an order for goods, for example informa-
tion, in which case the person-specific information is
the person's address, electronic or physical, to which
the information is to be sent. It can also consist of
an electronic signing of a document, in which case the
15   person-specific information is the person's signature
in digital format. A further example is subscribing to
shares, which requires access to more than one type of
person-specific information, for example civic registra-
tion number and address. A person skilled in the art can
20   find further examples of operations that require access
to person-specific information that is of the nature that
it is not changed often but can be previously stored in
the network-based system in order to be used by various
parties in the system for the carrying out of operations
25   concerning various goods and services when the person so
permits.

The goods or services are indicated on the product.
By this it is meant that there is information on the pro-
duct so that the user can understand which goods or ser-
30   vices are intended and what effect reading off the posi-
tion-coding pattern in the operation field will have. The
product can be any product on which one or more items of
goods or services can be indicated and on which a posi-
tion-coding pattern can be applied in such a way that it
35   can be read off by a hand-held device which is intended
for this purpose. The product is preferably a physical
product and can, for example, be a sheet of paper, a bro-

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chure, a catalogue, a newspaper, a form or packaging of
some suitable material. The product can advantageously be
of such material that it is possible to write information
with an ordinary pen point.

5   The position-coding pattern can be any type that
codes coordinates for positions with a resolution that
makes it possible to record electronically text handwrit-
ten with a normal pen point. The pattern is preferably
of the type described in Applicant's international Patent

10   Applications WO 01/26032 and WO 01/26033.

A great advantage of the use of a position-coding
pattern of the type described above in comparison to some
other type of code is that the position-coding pattern
makes it possible also to record graphical information

15   which is drawn by hand.

For example, the mark which is made in a payment
box can be recorded and stored in the system. This makes
possible later comparison with the physical mark which
the user has made in the advertisement. The user can

20   additionally choose to make the mark as a personal mark
instead of just a cross or a tick.

In addition, the position-coding pattern allows
the user to attach any graphical information that is not
coded or specified in the system itself to another party

25   in the system, which naturally increases the flexibility
of the system considerably. The user can thus attach a
more detailed specification of the operation or a message
with requirements or information concerning the operation
to the other party.

30   The position-coding pattern has thus the dual func-
tion of coding information and of making possible record-
ing of graphical information.

In the simplest case, the reading off of the posi-
tion-coding pattern can be carried out by reading off

35   such part of the position-coding pattern that codes coor-
dinates for a single position. In other cases, it can be
necessary to read off coordinates for several positions.

At the same time as the reading off, a mark can be made
with a pen point on the device. This has the advantage
that the person who carried out the reading off has a
"receipt" or confirmation that the reading off has been
5. carried out.

    The hand-held device can be any device that is suit-
able for reading off a position-coding pattern. The posi-
tion-coding pattern can be optically readable, or can be
readable by some other physical principle, such as elec-
10 tromagnetic, capacitive, inductive, chemical, etc.

    In a preferred embodiment, the step of giving an
instruction comprises reading off the position-coding
pattern by means of a hand-held device that has a unique
identity with which the person-specific information is
15 associated.

    The person who uses the device and who gives in-
structions to the system about the carrying out of the
operation does not need to enter any identification data
in order for the operation to be able to be carried out
20 using the person-specific information, as the person is
identified by means of the identity of the hand-held
device. This can be a serial number, that is a unique
product identification or manufacturing number, or some
other unique code that has been stored in the device
25 for identification purposes. The identity is preferably
stored in hardware or in some other way that makes it
difficult for a user to change it.

    The step of giving an instruction preferably com-
prises giving an instruction to make the person-specific
30 information available to a party that needs to use it in
connection with the carrying out of the operation.

    By reading off the position-coding pattern in the
operation field, the person thus gives permission for the
person-specific information to be made available to and
35 to be able to be used by a party that is involved in the
operation. If the operation, for example, is a payment,
the instruction can comprise an instruction to allow a

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payment recipient to have access to the person's credit
card number and obtain payment from the credit card
account.

If the operation is a signing of a document, the
5   instruction can comprise an instruction to give the one
requiring the signature on the document access to the
person's digital signature for addition to the document.

In response to the reading off of the position-
coding pattern the device thus makes the person-specific
10   information available, e.g. by means of the unique iden-
tity, to the party that needs it.

In this way, a remotely controlled operation can
be achieved using pen and paper, albeit pen and paper of
a special type.

15   The method can further comprise the step of using
the hand-held device to create and record electronically
graphical information that is to be attached to the said
instruction by moving the device across an information
field which is provided with the position-coding pattern
20   on the product and which is intended to receive the gra-
phical information.

Even though an operation in its simplest form can
be carried out simply by reading off the position-coding
pattern in the operation field, there are operations
25   where it can be advantageous for the person to add sup-
plementary information of a non-recurrent type that is
only relevant for the operation in question, for example,
regarding the number of products that a payment concerns
or in the form of a signature as confirmation of the ope-
30   ration. The position-coding pattern is very suitable for
this, and thus the same technique can be used to instruct
the system to carry out the operation and to add addi-
tional information simply and quickly. The supplementary
information can, of course, also consist of simple marks
35   in other fields or boxes on the product. These fields or
boxes can, for example, specify choice of goods or ser-
vices from various goods or services that are indicated

on the product, or can qualify the operation, for example by specifying which method of payment is to be used.

The information field can be a separate field or can be combined with the operation field. The positions that

5 are coded in the information field and operation field need not have a relationship that corresponds to the physical relationship on the product but instead the relationship can be a different one.

A particularly interesting operation to be able to

10 carry out in a mobile way using a hand-held device is, as mentioned, a payment operation. In a preferred embodiment the system is therefore a payment system, the operation is a payment, the person-specific information is the person's account and the instruction is an instruction to

15 the effect that a payment is to be made from the account.

As the person-specific information is previously stored in the system, a person can carry out a payment just by reading off a position-coding pattern, without needing to specify a long account number which the person

20 has not normally memorized.

The method described above is of particular interest to the person when he or she can store one or more items of person-specific information in the same place in the system, from which the item or items of information can

25 be made available to various parties connecting to the system. The person does not then need to store the information with each new party with which the person wants to carry out operations in the way described above by reading off a position-coding pattern in an operation field.

30 According to a second aspect of the invention, this relates to a method in a hand-held device for initiating an operation concerning goods or services indicated on a product. The method is characterized by the steps of receiving a position-coding pattern from the product,

35 identifying, by means of coordinates which the position-coding pattern codes, an instruction from a person who uses the device to the effect that an operation is to be

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carried out using person-specific information previously
stored in the system and making possible the carrying out
of the operation by communication with a network-based
system.

5   The advantages of this aspect of the invention are
apparent from the above.

The hand-held device thus receives a position-coding
pattern. Reception can take place by a sensor in the de-
vice recording one or more images of the position-coding

10   pattern. Each image contains a subset of the position-
coding pattern which corresponds to the field of vision
of the device. By reception of the position-coding pat-
tern is thus not meant the reception of the whole posi-
tion-coding pattern, but just of a subset of this. In

15   order to simplify the description, reference is, however,
just made to the position-coding pattern.

The device itself preferably decodes the position-
coding pattern and determines to what coordinates this
corresponds. Alternatively, the device can send the

20   received position-coding pattern for decoding in some
external unit. This is, however, a less preferred em-
bodiment as it requires considerable bandwidth.

The coordinates represent the instruction given by
the person who uses the device. The instruction can be

25   identified by the device or by an external unit to which
the coordinates are sent. The device may for instance
store a list of coordinates and corresponding instruc-
tions. The instruction need not be explicitly identified.
It suffices that the device obtains enough information

30   from the coordinates in order for it to be able to take
the steps needed for making possible the carrying-out
in the network of the operation that corresponds to the
instruction by the user of the device.

An important function of the device is to identify,

35   by means of the coordinates which the position-coding
pattern codes, a party that needs to utilize the person-
specific information in connection with carrying out the

operation. The coordinates make this possible. The device itself can contain means to make it possible to identify the party, but this would require considerable memory space in the device and would necessitate reprogramming
5   whenever new parties are connected to the system.

In a preferred embodiment, the step of identifying the party therefore comprises sending at least some of the coordinates to a first computer and receiving in response information about a network address of the party's
10   computer. In this way, the hand-held device obtains information about with which party it is to communicate and how the party is to be reached via the network.

The network can be any computer network, preferably the Internet.
15   The party can, for example, be a payment recipient or a provider of information or an intermediary of some kind.

As mentioned above, the person-specific information can be made available to the party for the operation.
20   In one embodiment, this can be carried out by the device creating an operation code and sending it to the party's computer and to an additional computer in the network that stores the person-specific information, so that the party can obtain access to the person-specific
25   information from the additional computer by means of the operation code.

This makes it possible for the person-specific information to be stored at a single location in the system, namely in the additional computer which is accessi-
30   ble to all the possible parties that can connect to the network. The user can store it there himself. The storage can be carried out easily by the user himself. The additional computer can also be protected by other security systems than are possible for the hand-held device.
35   For security reasons, the operation code can be a random number or a time stamp. It can alternatively be generated in accordance with predetermined rules or be

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retrieved from a list in the device. This is, however, less secure. The operation code can also be generated by some external unit with which the hand-held device communicates.

5   The person-specific information is preferably stored in association with the device's unique identity so that this can be used to obtain the person-specific information. For this purpose, the method preferably comprises the step of transmitting to the additional computer and

10   to the party a device identity which uniquely identifies the hand-held device and with which the person-specific information is associated.

As an alternative, the person-specific information can be made available by the device retrieving it from

15   a memory in the device and sending it to the party. The person-specific information must then be programmed into the device, preferably by the user, which means that such programming must be supported.

As a further alternative, the device should be able

20   to retrieve the person-specific information from some external unit, for example from the additional computer, and send it to the party.

For certain operations a person can have more than one item of person-specific information that can be rele-

25   vant for the carrying out of the operation. For example, if the operation is a payment, the person can have different accounts from which payments can be made. These can be stored in the additional computer where they are associated with the device's unique identity. The choice

30   of what person-specific information is to be used can be carried out in various ways. One variant for making the person-specific information available comprises identifying the person-specific information from a plurality of items of person-specific information on the basis of

35   the coordinates which the position-coding pattern codes.

Another variant is that the step of making the person-specific information available comprises receiv-

ing from the person a choice of the person-specific in-
formation from a plurality of items of person-specific
information.

According to a third aspect of the invention, the
5   method described above can be realized using a computer
program which is stored on a memory medium. The program
can, for example, be stored in a memory in the hand-held
device and executed by a computer in the hand-held de-
vice.

10 According to a fourth aspect of the invention, this
relates to a hand-held device for initiating an operation
concerning goods or services indicated on a product, com-
prising a sensor for recording a position-coding pattern
and a signal-processing unit for implementing the method
15 described above.

According to a fifth aspect of the invention, this
relates to a system for making possible at least one
operation in a network concerning goods or services in-
dicated on a product, which operation is intended to be
20 initiated using one hand-held device of a plurality of
hand-held devices by reading off a position-coding pat-
tern, which codes coordinates, in an operation field on
the product, characterized by a device database which
stores a unique identity for each of the devices and at
25 least one item of person-specific information, associated
with each identity, for the person who is the owner of
the device, so that the operation can be carried out by
a party in the network using the person-specific informa-
tion stored in the device database, the person-specific
30 information being retrievable by the party by means of
the device identity, which is sent to the party in re-
sponse to the device reading off the position-coding
pattern in the operation field on the product.

According to a sixth aspect of the invention, this
35 relates to a product which comprises an indication con-
cerning goods or services, and which is characterized by
an operation field on the product which is provided with

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a position-coding pattern which codes a plurality of co-
ordinates which represent an instruction to a network-
based system to carry out an operation regarding said
goods or services using person-specific information pre-
viously stored in the system, which person-specific in-
formation is associated with a unique identity of a read-
ing-off device which a person who wants to carry out the
operation uses to read off the position-coding pattern.

The advantages of these aspects of the invention
are apparent from the discussion above. What was said
concerning the method is naturally also applicable where
appropriate for the product, the system and the device.

Brief Description of the Figures

This invention will be described in greater detail
in the following with reference to the accompanying draw-
ings, in which

Fig. 1 shows an overview of a system according to an
embodiment of the invention.

Fig. 2 shows a product according to an embodiment of
the invention.

Figs 3a-c show examples of how the virtual surface
can be arranged.

Fig. 4 shows an overview of a system according to a
second embodiment of the invention.

Fig. 5 shows an embodiment of a device according to
the invention.

Fig. 6 shows a flow chart of an example of a method
according to the invention.

Description of Preferred Embodiments of the Invention

Fig. 1 shows a network-based system for carrying out
of operations concerning services or goods. In order to
simplify the description, it is assumed in the following
that the operation to be carried out is a payment.

The system in Fig. 1 comprises a product 100 in the
form of a sheet of paper, on which there is a printed
advertisement for a service in the form of a subscription
to a Pay-TV channel. The advertisement specifies in the

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normal way terms and conditions and the cost of the sub-
scription. The advertisement further comprises an opera-
tion field 102 in the form of a payment box which is pro-
vided with a position-coding pattern. Finally the adver-
5   tisement also comprises an explanation of what a tick in
the payment box means.

The position-coding pattern in the operation field
codes coordinates for positions on a virtual surface,
which is an imaginary surface made up by all the unique
10   points for which the position-coding pattern is able to
code the coordinates. The surface is divided into a very
large number of coordinate areas. The payment box is pro-
vided with a subset of the position-coding pattern that
corresponds to positions within a particular coordinate
15   area, which the advertiser has acquired the right to use.

The position-coding pattern can be the position-
coding pattern that is described in the above-mentioned
WO 01/26032 or any other kind position-coding pattern
that codes absolute positions.

20   The system further comprises a hand-held device
104 in the form of an electronic pen. A unique identity
number is stored in the pen which identifies the pen.
The pen can communicate with computers in a network 105,
for example the Internet, via integrated communication
25   circuits or via a network connection unit (not shown),
for example in the form of a mobile phone, a PDA or a
computer. The network is depicted by a "cloud" in the
figure.

In this embodiment, the pen 104 communicates with
30   three computers 106, 108 and 110. The first computer 106
stores, in an address database, information about various
coordinate areas on the virtual surface, for example who
has the right to a particular coordinate area (below also
called the owner) and which operation this coordinate
35   area represents.

The second computer 108 stores, in a device data-
base, the unique identity number of the electronic pens

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that are connected to the system. For each pen's identity
number there is also stored at least one item of person-
specific information, which in this case consists of an
account number and name and address of the pen owner.

5   The third computer belongs to a party in the system
who is responsible for the offer in the advertisement,
who is to ensure that the service is provided and who is
to receive payment for the service (below also called
the advertiser).

10   Now assume that the company TeVe AB has bought the
right to use a particular coordinate area on the virtual
surface and the subset of the position-coding pattern
corresponding to this, and that the company has in addi-
tion decided to use the coordinate area to make it easier

15   for potential customers to access their Pay-TV channel.
Advertisements are then printed with payment boxes 102
with the relevant subset of the position-coding pattern.
In addition, the first computer 106 is informed that the
coordinate area is to be used for a payment operation. In

20   the first computer 106 information is then stored to the
effect that the coordinate area in question belongs to
TeVe AB, an IP address of TeVe AB's computer 110 to which
the electronic pen is to send information, and informa-
tion to the effect that the coordinate area in question

25   concerns a payment operation, i.e. information concerning
which instruction the coordinate area corresponds to.

        Now also assume that the pen owner 104 reads the
advertisement and wants to have access to the advertised
Pay-TV channel. He takes his pen and makes a mark in the

30   payment box 102 with a pen point on the device. The part
of the position-coding pattern in the payment box which
lies within the field of vision of the pen is continually
recorded while the mark is being made.

        The marking means an instruction to the system to

35   the effect that the pen owner wants to buy the service
in the advertisement and gives permission for money to
be taken from the account the pen owner has previously

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recorded in the second computer 108 as associated with the identity number of the pen 104. The service is to be provided to the address that the pen owner has also recorded previously in the second computer 108 as asso-
5   ciated with the identity number of the pen.

When the pen 104 receives the position-coding pattern, it decodes the pattern and determines which coordinates the pattern codes. These coordinates are sent by the pen to the first computer 106, together with the
10   identity number of the pen.

In the first computer 106, it is checked who is the owner of the coordinate area to which the received coordinates belong. In this case it is TeVe AB. The first computer 106 sends TeVe AB's address and the stored in-
15   formation to the effect that the operation in question is a payment to the pen, utilizing the pen's identity number to determine the pen's address.

If the communication with the pen 104 is carried out via the pen owner's mobile phone, information about
20   the owner of the coordinate area can be displayed on the mobile phone's display and confirmation from the pen owner can be required in order for the payment operation to be completed.

The confirmation can be carried out simply by press-
25   ing a button. In order to increase security and prevent fraudsters from using stolen pens, the confirmation can be required, for example, in the form of a PIN code or biometric data.

When the pen receives a response from the first
30   computer 106, it creates an operation code by generating a random number. This operation code is sent together with the pen's identity number and any information to the effect that it is TeVe AB that is a party to the operation to the second computer 108 where the operation code
35   is stored in association with the pen's identity number which is already recorded from a previous occasion. The

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address of the second computer can for instance be stored in the pen or obtained from the first computer.

The pen 104 also sends the operation code and its identity number to the third computer 110, which is here
5 TeVe AB's computer, the address of which the pen received from the first computer.

When the third computer 110 receives this information from the pen, it knows that a customer wants to subscribe to the Pay-TV channel and pay for this, as this
10 advertisement is the only one that the company is running at present. It sends the operation code and the pen's identity number to the second computer 108. The second computer checks that the operation code is the same as the one it obtained earlier from the pen 104. If this is
15 the case, it allows TeVe AB's computer 110 to have access to the account number, name and address of the pen owner. Using this information TeVe AB can provide the service to the pen owner and can receive payment from his bank account. Communication with the pen owner's bank can take
20 place by current methods and is therefore not described here in greater detail, but is depicted with broken lines by arrows and a can 112.

A great advantage of this system is the storage of the person-specific information in the second computer
25 108 from which the information can be obtained by new parties that connect to the system.

Of course, the system described above can be varied in many ways to achieve the same advantages.

For example, the operation code could be generated
30 by the first computer 106 instead of by the pen and could be sent back to the pen. In this case, the first computer could transmit the pen's identity number, operation code and information about the owner of the payment box direct to the second computer. This would have the advantage
35 that the pen only needs to send one message, namely the message to the owner of the payment box.

If the pen owner has several items of person-speci-
fic information of the same type stored in the second
computer 108, for example several accounts, the second
computer can send a query to the pen 104 regarding which
5   item of information is to be used for the operation. The
alternatives can, for example, be displayed to the pen
owner on the display of his mobile phone and the selec-
tion can be made using the keypad of the phone and sent
back to the second computer 108 and in addition if neces-
10   sary forwarded to the third computer 110.

In an alternative embodiment, the person-specific
information could be stored in the pen and sent by this
straight to TeVe AB's computer 110. The second computer
108 is thus not needed, at least not for storage of the
15   person-specific information.

The first and the second computers could also be one
and the same computer. The term "computer" is to be taken
here in the broad sense. It can be a network server.

Confirmation can also be requested at different
20   stages and by different parties in the system.

Of course, various forms of encryption can also be
used for the communication between the different units
in the system.

Fig. 2 shows a product 200 in the form of a page
25   with an advertisement which offers the customer a wider
choice of options. In the following, the advertisement
is assumed to use the same system as that described in
Fig. 1. The advertisement offers two types of goods 202
and 204, in the form of two different items of clothing.
30   In the same way as in the advertisement in Fig. 1, there
is a payment box 206 in the advertisement. There are in
addition three boxes A, B, C in the advertisement which
define the payment operation. For example, A, B, C can
correspond to three different types of credit card. In
35   the different boxes A, B, C there are three different
subsets of the position-coding pattern. In addition,
in the first computer 106 information is stored to the

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effect that the corresponding coordinate areas represent
the three different types of credit card.

For example, if the pen owner has recorded two dif-
ferent credit card numbers for two different credit card
companies in the second computer 108, he can choose which
of these is to be used for the payment by making a mark
in the corresponding box in the advertisement.

For each of the goods there is also a box 208 and
210 with a subset of the position-coding pattern. These
subsets correspond to partial areas in a coordinate area
to which the advertiser has acquired the right.

In this example, the boxes 208, 210 and A-C consti-
tute information fields, in contrast to the box 206 which
constitutes an operation field.

The advertiser can inform the first computer 106
what these partial areas represent so that the first
computer can send an indication concerning this to the
pen which forwards the indications to the advertiser.

In a preferred embodiment, however, the advertiser
himself stores in his computer 110 what the partial areas
represent. In this way the advertiser can reuse corre-
sponding subsets of the position-coding pattern for
different goods and services in a simple way.

Now assume that the pen owner wants to buy the
uppermost item of clothing 202 in the advertisement and
wants to use credit card B. He accordingly ticks the box
208 for the uppermost item of clothing, box B for credit
card B and finally the payment box 206.

The pen decodes the received position-coding pattern
and determines which coordinates this represents. In this
case, the different subsets of the position-coding pat-
tern code coordinates for points within different coor-
dinate areas on the virtual surface. The pen recognizes
that the coordinates from the payment box 206 and the
coordinates from the credit card box B are such that are
to be sent to the first computer 106. This determines
that the coordinates from the payment box 206 come from

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an area on the virtual surface that belongs to the adver-
tiser and concerns a payment. It further determines that
the coordinates from box B concern a credit card company
B. It sends back the address of the advertiser, informa-
5   tion to the effect that the intended operation is a pay-
ment and that the payment is to be made by means of cre-
dit card B.

In the same way as in the example in Fig. 1, the pen
creates an operation code and sends this to the second
10   computer, together with the pen's identity number and an
indication that credit card account B is to be used.

In addition, the operation code, the pen's identi-
fication number and information to the effect that it is
credit card account B that is to be used, are sent to the
15   advertiser. When the advertiser receives this message,
the advertiser knows that a purchase is to be made, but
not of what, as the advertisement contains several types
of goods and as the advertiser has perhaps several types
of advertisements with payment boxes.

20   In the advertiser's computer 110, there is stored,
however, which coordinate area the advertiser has ac-
quired. The advertiser's computer then sends a request
to the pen, the address of which can be obtained, for
example, from the second computer 108 or can be apparent
25   from the message from the pen, to the effect that the pen
104 is to send all the coordinates that it has stored
within the advertiser's coordinate area.

The advertiser's computer 110 then receives the
coordinates that correspond to the mark in the box 208
30   for the uppermost item of clothing and in this way can
determine what the pen owner wants to buy and pay for.

As an alternative, it is possible for the first
computer 106 to inform the pen to which coordinate area
the advertiser has the right and it is possible for the
35   pen to include all the coordinates from that area in the
message to the advertiser's computer straight away, so

that this does not need to request the coordinate infor-
mation from the pen.

The boxes 208 and 210 concerning the items of cloth-
ing can be made larger and designed so that they are
5   suitable for containing handwritten text. Instead of mak-
ing a mark in the box beside the uppermost item of cloth-
ing, the pen owner can then write by hand in the box that
he wants two items of clothing in size medium and in the
colour blue. This is an efficient way of letting a user
10   specify additional information. An alternative would be
to code all possible options with position-coding pat-
terns, but this would give the advertisement an overcom-
plicated appearance. In addition, it is difficult to
foresee all the information that a user might want to
15   send to a party in the system.

In the case of the handwritten additional informa-
tion, the advertiser's computer 110 receives the coordi-
nates that represent the movement of the pen when the
additional information was being written and can thereby
20   recreate an image of the written information which can be
interpreted using an ICR program (Intelligent Character
Recognition) in the computer or by a person.

In the description of both the preceding examples,
the payment box is provided with a subset of the posi-
25   tion-coding pattern that the advertiser has acquired and
the advertiser himself has decided that this subset is to
be used to represent a payment operation and has informed
the first computer 106 of this. As an alternative, it
is possible for the payment box to contain two separate
30   subsets of the position-coding pattern, where a first
subset represents the advertiser and a second subset
represents in general the operation of making a payment.
In this way all the parties in the system can use the
same subset to represent the payment operation and can
35   combine this subset with a subset that is specific to the
advertiser. If the advertisement contains only one item
of goods or one service, in addition the advertiser can

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select a subset within the area of the position-coding
pattern to which he has acquired the right so that this
subset also makes it possible for the advertiser to iden-
tify to which advertisement out of a plurality of adver-

5   tisements the message from the pen refers. In order for
this to be possible, the pen must, however, in this case
send the coordinates which correspond to the mark in the
payment box.

Of course, the above can be generalized to apply to

10 any operation. In addition the above "divided" boxes can
contain more than two different subsets of the position-
coding pattern. For example, the pattern from the three
credit card boxes A-C could be incorporated into three
separate payment boxes. The payment box 206 could thus

15 be replaced by three payment boxes for payment by means
of credit card A, B or C.

It has been stated above that the first computer 106
has stored information about what the coordinate areas
corresponding to the subsets of the position-coding pat-

20 tern in the credit card boxes A, B, C, refer to. Accord-
ing to another variant, the advertiser could use three
partial areas within his coordinate area on the virtual
surface in order to create three different payment but-
tons, one for each of the credit cards, A, B, C. In this

25 case, it is the advertiser's computer that identifies
which credit card is to be used, on the basis of coordi-
nate information from the payment box.

As a further variant, the advertisement could con-
tain a payment box that is coded in such a way that

30 the second computer returns information about possible
methods of payment to the pen, whereupon the pen owner
has the ability to select the method of payment, for
example via his mobile phone.

Figs 3a, b and c show examples of how different

35 coordinate areas on the virtual surface can be used.

Fig. 3a shows an example that corresponds to the
embodiment in Fig. 1. TeVe AB has acquired the right

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to the area 300 on the virtual surface. This lies within a larger region 320 of the virtual surface within which different areas can be acquired by different parties. The pens that are included in the system are programmed

5   that when they detect coordinates within this region they are to send at least some of the coordinates to the first computer for determination of who is the owner of the area to which the coordinates belong. TeVe AB has itself specified that the sub-area 301 within the area 300 is to

10   be used to represent a payment operation. The first computer 106 has been informed of this, and thus can return this information to the pen when it receives coordinates within the sub-area 301.

TeVe AB can also have defined that the sub-area 302

15   is to be used for ordering operations that use address information stored in the system.

In a corresponding way, other parties can define what other areas are to be used for. A precondition is, of course, that the pen supports the operation defined

20   by a party.

Fig. 3b shows an example of the layout of the virtual surface in the case corresponding to the embodiment in Fig. 2. In this case, the advertiser has acquired the right to the area 310. In the same way as in the previous

25   example, he has defined that a sub-area 312 is to be used for payment operations and has informed the first computer of this. He has also defined different sub-areas 314, 316 for items of clothing in the advertisement in Fig. 2 and stored information in his computer himself

30   about what these sub-areas refer to. On the virtual surface there are in addition three areas that represent the different credit card companies A-C. These sub-areas lie within the region 320 which concerns coordinates that are to be sent to the first computer 106, but the first com-

35   puter is arranged for these sub-areas to return information about which credit card company is referred to and thus not a network address for these.

Fig. 3c shows the layout of the virtual surface when the above-mentioned example with "divided" boxes is used. In this case, the advertiser has acquired the right to the area 330. When he wants to create a payment box, he

5   uses a subset of the position-coding pattern that corresponds to the sub-area 332 within the area 330 and combines this with a subset of the position-coding pattern that corresponds to an area 340 that defines in general the operation of making a payment and which therefore

10 lies within a section 350 of the region 320 that belongs to the system administrator and for which the first computer returns to the pen an indication of which operation is referred to.

It should be emphasized that as the preferred posi-

15 tion-coding pattern described below is used, the payment box will appear essentially identical to the user in all the cases described above.

If a divided box is used, the user must make a mark that extends through most of the box so that both the

20 subsets of the position-coding pattern are read off.

In the following, a further example is described of a system for carrying out an operation regarding goods or services using person-specific information previously stored in the system. The system is described with refe-

25 rence to Fig. 4.

This system can be used to make it possible for a pen owner to pay his bills in a very simple way via, for example, a bank or postal giro account.

Assume now that company X, which is represented by

30 its computer 400, is to invoice a customer who has an electronic pen 402. The company X creates an invoice 404 in the normal way. The invoice has a specification part which specifies services or goods that have been provided or that are going to be provided. It consists therefore

35 of a product with an indication of goods or services.

The company X provides the invoice 404 with a payment box 406 with a subset of the position-coding pattern

which corresponds to a sub-area in a coordinate area
which the company X has acquired. A unique subset is used
for each invoice, corresponding to a unique sub-area.
The subsets can, however, be reused.

5   The company X also informs (arrow from 400 to 408)
the giro bank's computer 408 that the invoice in ques-
tion, that has a particular number, has been provided
with a subset of the position-coding pattern which codes
coordinates within a particular sub-area. The giro bank

10   stores this information in a database in its computer
408.

When the pen owner wants to pay the invoice he just
makes a mark in the payment box 406 with his pen. When
the pen decodes the position-coding pattern which was

15   recorded when the mark was made, the pen recognizes coor-
dinates which are to be sent to a predetermined computer
410 (corresponding to the first computer in Fig. 1) to
determine who is the owner of the coordinate area to
which the coordinates belong.

20   The pen 402 receives back a network address of the
giro bank's computer 408. It then sends its unique iden-
tity number and the decoded coordinates to the giro
bank's computer 408, which identifies in its database
that the coordinates refer to, for example, invoice no.

25   3218.

The identity numbers of the pens with which giro
payments are able to be made can also be stored in the
giro bank's computer 408, and associated with each of
these identity numbers there is person-specific informa-

30   tion, which in this case is the account from which the
invoice sum is to be debited.

Alternatively, the giro bank's computer can make
a look-up in the equivalence of the second computer 108
in Fig. 1 in order to obtain from there details of the

35   account from which the money is to be taken. In connec-
tion with this, an operation code may need to be gene-

rated and sent to both the giro bank's computer and the
second computer.

Using the information obtained in this way, the giro
bank can now carry out the transfer from the pen owner's

5   account to the account which is indicated on the invoice
as the recipient of the invoice sum and which is stored
in the giro bank's computer.

Of course, variants are also possible where the user
adds graphical information in a corresponding way to that

10   described in the examples above. For example, the user
could fill in an amount himself in an information field.
This variant can, for example, be used when there are
different alternatives on the invoice, such as payment
for one or more products.

15   With reference to Fig. 5, a hand-held device that
can be used in the system according to the invention will
now be described.

The device comprises a casing 11 which is approxi-
mately the same shape as a pen. In a short side of the

20   casing there is an opening 12. The short end is intended
to be held in contact with or a short distance from the
surface from which the position-coding pattern is to be
read off.

The casing contains essentially an optics part,

25   an electronic circuitry part and a power supply.

The optics part comprises at least one light-
emitting diode 13 for illuminating the surface which
is to be imaged and a light-sensitive area sensor 14,
for example a CCD or CMOS sensor, for recording a two-

30   dimensional image. The device may also contain an opti-
cal system, such as a reflector and/or lens system. The
light-emitting diode can be an infrared light-emitting
diode and the sensor can be sensitive to infrared light.

The power supply for the device is obtained from a

35   battery 15 which is mounted in a separate compartment
in the casing.

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The electronic circuitry part comprises a signal
processing means 16 for determining one or more posi-
tions, or more specifically coordinates for the one or
more positions, on the basis of the images of the posi-
5   tion-coding pattern recorded by the sensor 14. The signal
processing means can be a processor unit with a micro-
processor which is programmed to read in images from the
sensor and to determine positions on the basis of these
images. It can also be an ASIC or an FPGA. The micro-
10   processor can also be programmed to recognize predefined
coordinates or coordinates within pre-defined coordinate
areas and to carry out certain operations in response to
the recognition of these coordinates or coordinate areas.
One operation could be to send the coordinates to a pre-
15   determined computer, such as the first computer in fig 1,
in order to obtain an address to a party which is the
owner of the coordinate area to which the decoded coordi-
nates belong and in order to obtain an indication of the
operation to which the coordinates correspond.
20   The device also comprises in this embodiment a pen
point 17, using which the user can carry out ordinary
pigment-based writing. The pen point 17 is extendable and
retractable so that the user can control whether or not
it is to be used. In certain applications the device does
25   not need to have any pen point at all.
The pigment-based writing is suitably of such a type
that it is transparent to infrared light and the marks
absorb infrared light. By using a light-emitting diode
that emits infrared light and a sensor that is sensitive
30   to infrared light, the detection of the pattern can be
carried out without the above-mentioned writing inter-
fering with the pattern.
The device also comprises buttons 18 by which it is
activated and controlled. It also has a transceiver 19
35   for short-distance wireless transmission, for example
using infrared light, radio waves or ultrasound, of in-
formation to and from the device. In particular, the de-

vice can communicate with a mobile phone for transmission
of information to and from the Internet. The device can
also comprise a display 20 for displaying information.

Applicant's Swedish Patent No. 9604008-4 describes

5   a device for recording text. This device can be used for
carrying out operations according to the invention if it
is programmed in a suitable way. If it is to be used for
pigment-based writing, it must also have a pen point.

The device can be divided between different physical

10   casings, in which a first casing contains components that
are necessary for recording images of the position-coding
pattern and for transmitting these to components that are
located in a second casing and that carry out the posi-
tion determination on the basis of the recorded image or

15   images.

The method of initiating, in a hand-held device,
an operation concerning goods or services indicated on
a product is summarised in the flow chart of Fig. 6.

First, in step 601, the device receives a position-

20   coding pattern. The device decodes the position-coding
pattern and determines the coordinate(s) corresponding
thereto, step 602. In the next step 603, the party which
is the owner of the coordinate area, to which the decode
coordinate(s) belongs, is identified. At the same time

25   the instruction given by the user of the device is iden-
tified. This instruction indicates the operation to be
initiated. In response to the identification of the party
and the instruction, the device sends, step 604, an ope-
ration code and a device identity to the party and pos-

30   sibly also to a predetermined computer, which stores a
device database with the identities of all devices in
the system and, associated with each identity, a person-
specific piece of information. which is to be used by
the party when carrying out the operation.

CLAIMS

1. A method for a person to initiate an operation in
a network-based system, which operation concerns goods or
services indicated on a product, c h a r a c t e r i z e d
by the step of giving an instruction to the system to the
effect that the operation is to be carried out using per-
son-specific information previously stored in the system
by reading off a position-coding pattern in an operation
field on the product by means of a hand-held device,
which operation field is provided with a position-coding
pattern that codes coordinates which represent said in-
struction in the system.

2. A method according to claim 1, in which the step
of giving an instruction comprises reading off the posi-
tion-coding pattern by means of a hand-held device that
has a unique identity with which the person-specific
information is associated.

3. A method according to claim 1 or 2, in which
the step of giving an instruction comprises giving an
instruction to make the person-specific information
available to a party that needs to use it in connection
with the carrying out of the operation.

4. A method according to any one of the preceding
claims, further comprising the step of creating and re-
cording electronically by means of the hand-held device
graphical information that is to be attached to said
instruction by passing the device across an information
field on the product provided with said position-coding
pattern, which information field is intended to receive
the graphical information.

5. A method according to any one of the preceding
claims, in which the system is a payment system, the
operation is a payment, the person-specific information
is an account for the person and the instruction is an

instruction to the effect that a payment is to be made
from the account.

6. A method in a hand-held device for initiating
an operation concerning goods or services indicated on
a product, c h a r a c t e r i z e d   by the steps of
receiving a position-coding pattern from the product,
of identifying, by means of coordinates coded by the
position-coding pattern, an instruction from a person
who uses the device to the effect that the operation is
to be carried out using person-specific information pre-
viously stored in the system, and of making possible the
carrying out of the operation by communication with a
network-based system.

7. A method according to claim 6, in which the step
of making possible the carrying out of the operation com-
prises identifying, by means of coordinates coded by the
position-coding pattern, a party that needs to use the
person-specific information in association with carrying
out the operation.

8. A method according to claim 7, in which the step
of identifying said party comprises sending at least some
of the coordinates to a first computer and of receiving
in response an address in the network for the party.

9. A method according to claim 7 or 8, further com-
prising the step of making the person-specific informa-
tion available to the party.

10. A method according to claim 9, in which the
step of making the person-specific information available
comprises creating an operation code and sending it to
the party and to a second computer in the network which
stores the person-specific information.

11. A method according to claim 10, further compris-
ing the step of transmitting to the second computer and
to the party a device identity which uniquely identifies
the hand-held device and with which the person-specific
information is associated.

12. A method according to claim 6, in which the step of making possible the carrying out of the operation comprises making the person-specific information available to a party in the network-based system that needs to use
5   it in connection with the carrying out of the operation.

13. A method according to claim 12, wherein the person-specific information is made available to the party by means of a device identity which uniquely identifies the hand-held device and with which the person-specific
10 information is associated.

14. A method according to any one of claims 9-12, in which the step of making the person-specific information available comprises retrieving the person-specific information, preferably from a memory in the device, and send-
15 ing it to the party.

15. A method according to any one of claims 9-14, in which the step of making the person-specific information available comprises identifying the person-specific information from a plurality of items of person-specific
20 information on the basis of coordinates coded by the position-coding pattern.

16. A method according to any one of claims 9-14, in which the step of making the person-specific information available comprises receiving from the person a choice
25 of the person-specific information from a plurality of items of person-specific information.

17. A method according to any one of claims 7-16, further comprising the step of sending to said party coordinates coded by the position-coding pattern and
30 representing graphical information that was created by the user.

18. A method according to any one of claims 6-17, in which the operation is a payment.

19. A method according to claim 17, in which the
35 person-specific information is an account for the person and the instruction is an instruction to the effect that a payment is to be made from the account.

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20. A memory medium on which is stored a computer
program comprising instructions to cause a computer to
carry out a method according to any one of claims 6-19.

21. A hand-held device for initiating an operation

5　concerning goods or services indicated by means of print-
ed information on a physical product, comprising a sensor
for recording a position-coding pattern and a signal-pro-
cessing unit for carrying out a method according to any
one of claims 6-19.

10　22. A system for making possible at least one opera-
tion in a network concerning goods or services indicated
on a product, which operation is intended to be initiated
using one hand-held device of a plurality of hand-held
devices by reading off a position-coding pattern, which

15　codes coordinates, in an operation field on the product,
c h a r a c t e r i z e d　by a device database which
stores a unique identity for each of the devices and at
least one item of person-specific information, associated
with each identity, for the person who is the owner of

20　the device, so that the operation can be carried out by
a party in the network using the person-specific informa-
tion stored in the device database, the person-specific
information being retrievable by the party by means of
the device identity, which is sent to the party in re-

25　sponse to the device reading off the position-coding
pattern in the operation field on the product.

23. System according to claim 22, further comprising
an address database, which for each of a plurality of co-
ordinate areas, the coordinates of which are coded by the

30　position-coding pattern, stores an address in the network
of the party being the owner of the coordinate area.

24. A product comprising an indication concerning
goods or services, c h a r a c t e r i z e d　in that an
operation field on the product is provided with a posi-

35　tion-coding pattern that codes a plurality of coordinates
that represent an instruction to a network-based system
to carry out an operation concerning said goods or ser-

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vices using person-specific information which was pre-
viously stored in the system and which is associated with
a unique identity of a reading device used to read off
the position-coding pattern by the person who wants to
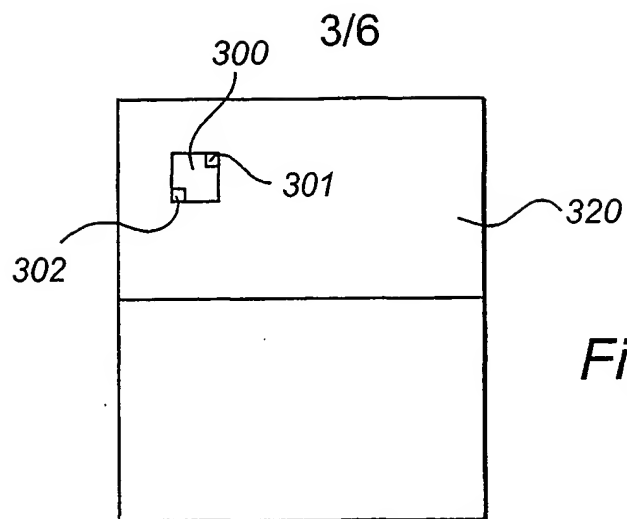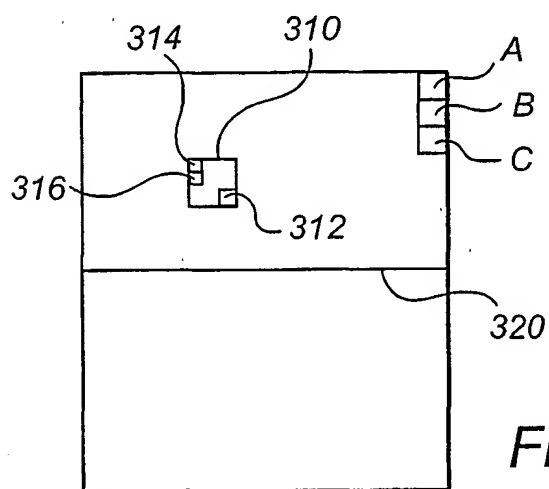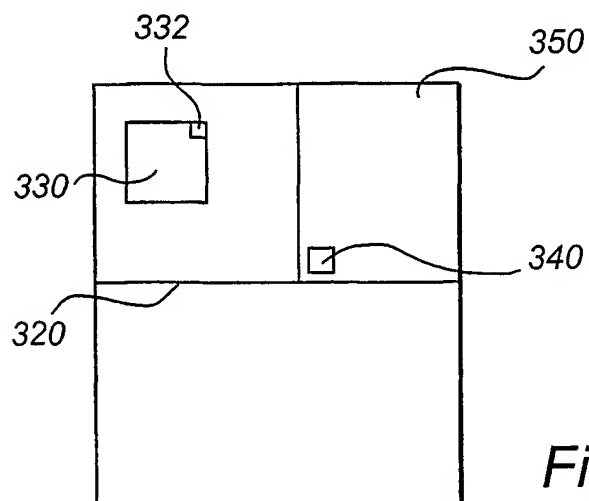5   carry out the operation.

Fig. 1

Fig. 2

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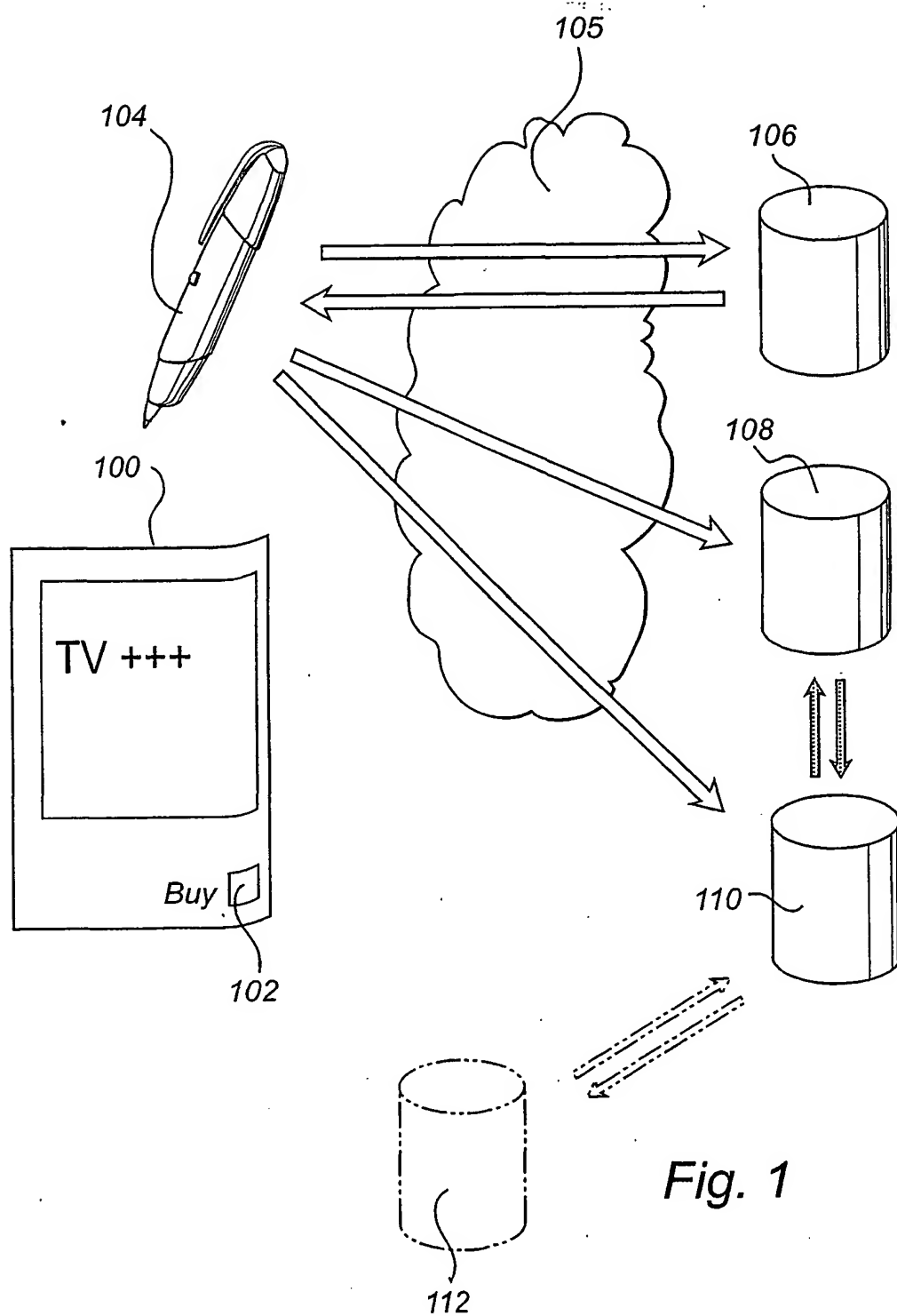
Fig. 3a

Fig. 3b

Fig. 3c

410

402

400

404

406

408
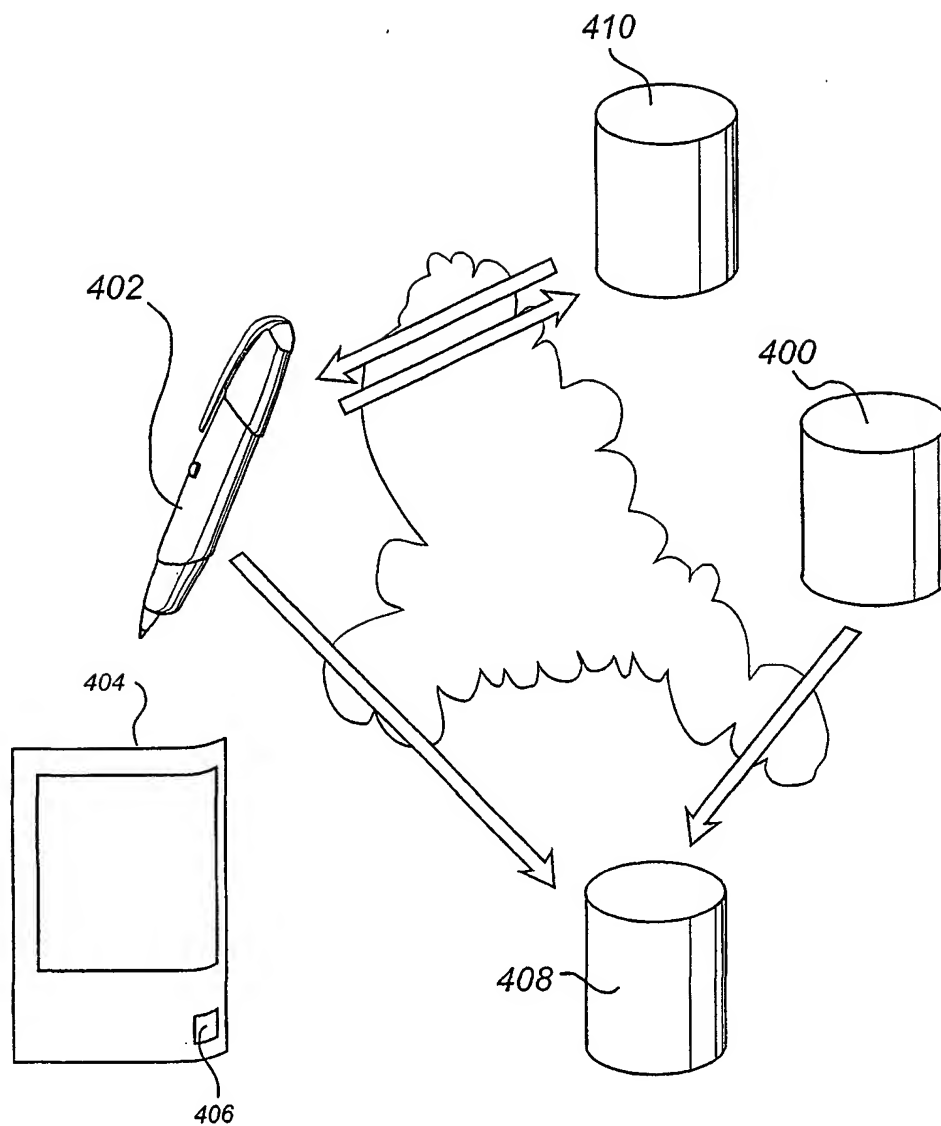
Fig. 4
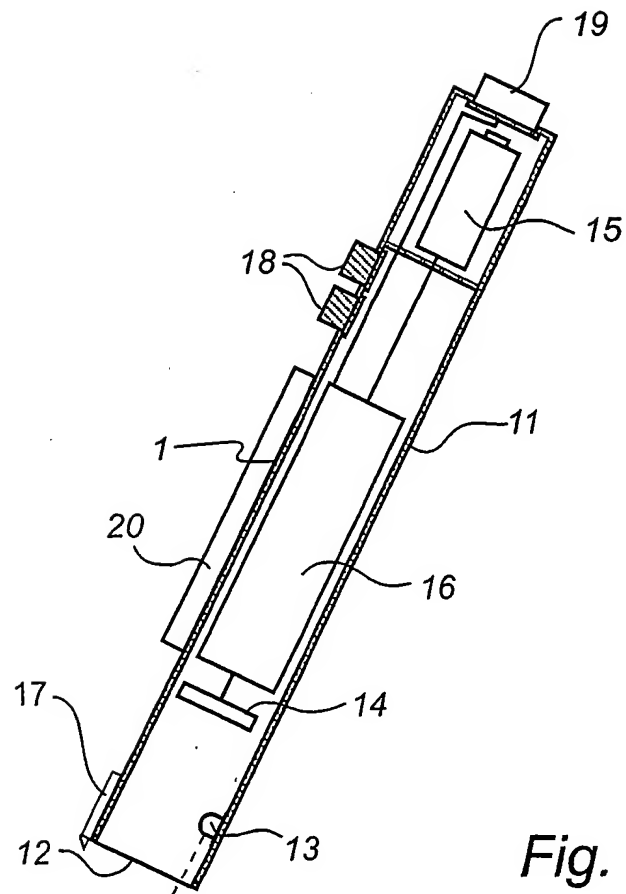
Fig. 5

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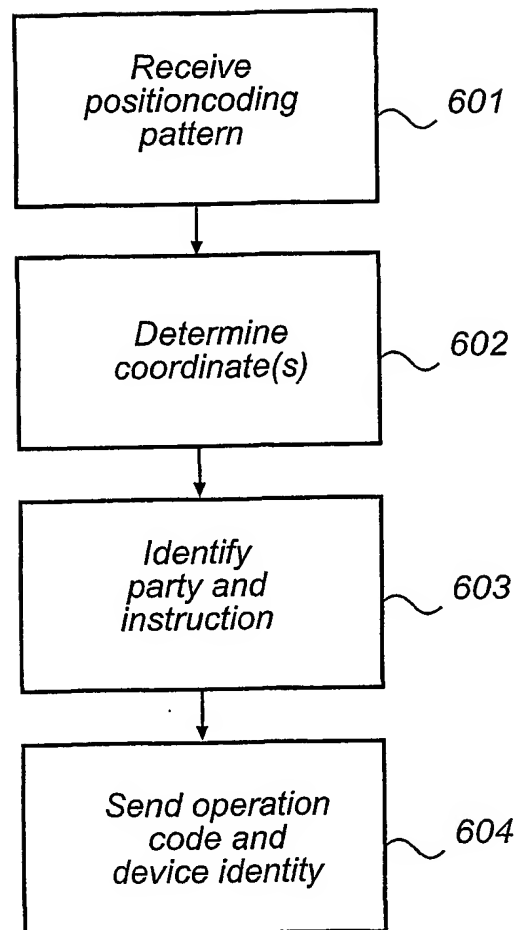
Fig. 6

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06K 19/06, G06F 3/033, G06F 17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06K, G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	WO 9950787 A1 (XEROX CORPORATION), 7 October 1999 (07.10.99), page 2, line 4 - line 18; page 10, line 6 - line 11; page 17, line 28 - page 18, line 2; page30, line 6 - line 27; page 33, line 17 - page 34, line 9, figures 1,5,7,10-11,14-15, claims 1-5, abstract	1-24
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[X] Further documents are listed in the continuation of Box C.   [X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
6 February 2002	19 -02- 2002

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